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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/523,595	03/10/2000	Paul Raymond Higginbottom	169.1628	5956

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EXAMINER
DANG, DUY M

ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 03/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

: Office Action Summary	Application No.	Applicant(s)	
	09/523,595	HIGGINBOTTOM ET AL.	
	Examiner	Art Unit	
	Duy M Dang	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *10 March 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 8-50* is/are rejected.

7)☒ Claim(s) *6 and 7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 March 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Drawing filed 3/1/00 are approved.

2. The disclosure is objected to because of the following informalities: In page 11, line 25, please delete "decom-posed" and insert "decomposed".

Appropriate correction is required.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-5, and 8-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chui et al. (US Patent No. 6,229,926. Referred as '926 hereinafter) in view of Chui et al. (US Patent No. 5,600,373. Referred as '373 hereinafter).

Regarding claim 1, Chui '926 teaches a method for encoding an digital image (see data processing circuitry 106 of figure 1 comprising machine 200 for performing encoding/compressing (col. 6 lines 17-26) digital image captured by the image capture device 102 in figure 1 (col. 6 lines 17-19 and col. 3 lines 16-23) comprising a plurality of pixels (see figure 2 and its

corresponding text portion mentioned in col. 4 lines 28-41. Note that each tile 144 of an array of 4x8 tiles of raw image data shown in this figure comprising an array of 32x32 i.e., 32 rows by 32 column in which each row and each column represent each pixel in the X position and each pixel in the Y position. Thus the 32x32 block does represent the 32x32 pixel block image captured by the camera 102 and such pixel is further processed by the data processing circuitry 106 according to figure 1), said image being able to be transformed by a discrete wavelet transform to a predetermined level of decomposition (see data processing circuitry 106 comprising machine 200 for image transformation (figure 1 and col. 6 lines 17-26). Note the transformation used in machine 200 is a wavelet transformation technique according to col. 1 lines 10-12 and col. 4 lines 47-48 and figure 2 (note the number 1-4 to the end of LL, LH, HL, and HH refer to the level of decomposition). Also refer the lengthy discussion about wavelet transformation method in col. 7 to line 6 of col. 8) and capable of being encoded on a block by block basis (see tile 144 shown in figure 2. Note that each tile 144 having a 32x32 block is transformed by wavelet transformation method and encoded by machine 200 included in data processing circuitry 106 as discussed above), each block having a specified block size in number of coefficients (see either 32x32 pixel

block of tile 144 or array of 4x8 tiles of raw image data shown in figure 2), in a first and second dimensions (refer rows and column shown in figure 2), the method comprising:

a) dividing the image into a plurality of tiles, each tile having firstly, substantially a minimum number of pixels required to produce the number of coefficients in the first dimension of said block at said predetermined level of DWT decomposition, and secondly, less than a minimum number of pixels required to produce the number of coefficients in the second dimension of said block at said predetermined level of DWT decomposition (see figure 2 which clearly teaches these features. Note that the raw image data comprises 32 tiles or an array of 4x8 tiles in which each tile is a 32x32 pixel block as discussed above);

b) selecting a current tile (see figure 2 which shows one of the tile 144 is selected and decomposed);

c) decomposing said current tile using DWT to at least one level of decomposition to form a plurality of subband including LL, LH, HL, and HH subband (see figure 2 which shows the selected tile is decomposed by using wavelet transformation as discussed above. This process is by the machine 200 of figure 1 employed wavelet transform method as discussed above);

e) accumulating LL subband coefficients and repeating steps b) to e) until a predetermined number of coefficients of the LL subband have been accumulated (see col.

f) assigning as a current tile said predetermined number of accumulated LL subband coefficients (see "LL" shown in figure 2;

g) repeating step c) to g) until the predetermined level of decomposition is reached (see figure 2. Note the numbers 1-4 suffixed to the subbands and "iteration" mentioned col. 4 lines 56-67); and

h) encoding the LL subband into the bit stream (see last line of col. 4 and col. 4 line 23-25).

Chui '926 fails to explicitly teach the features recited in step d). However, such features are well known in the art as evidenced by Chui '373.

Chui, in the same field of invention, that of image compression, teaches these features recited in steps d): accumulating coefficients in each subband of the LH, HL and HH subbands to form blocks of said specified size (see "sum of the coefficients in the LH, HL, and HH components of the decomposed image" mentioned in col. 26 lines 54-55 and shown in figure 13b) and encoding each said block to a bit stream (see compression 44 of figure 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate such accumulating as taught by Chui '373 in combination with Chui '926 because by incorporating such features would allow to meet a desired compression ratio as suggested by Chui '373 in col. 26 lines 25-30.

The advanced statements with regard to claim 1 above are incorporated hereinafter.

With regard to claim 10, Chui '373 further teaches features recited in step e) as mentioned in col. 26 lines 17-32. With regard to claim 21, both Chui '926 and '373 teach storage means (see working memory 104 in figure 1 of Chui '926 and video source 12 of figure 4a of Chui '373), filter means (see filter mentioned in line 6 of col. 7 in Chui '926; and filters 50 & 52 of figure 7 in Chui '373), partial band storage means (see working memory 104 of figure 1 in Chui '926, and storage 46 of figure 6 in Chui '373).

With regard to claims 28 and 37, Chui '926 further teaches the use of computer program stored on a computer readable memory medium (see col. 23, lines 18-23).

Claims 20 and 47-49 are also rejected for the same reasons as set forth in claim 1 because they recite the analogous features as recited in claim 1.

Regarding claims 2-5, Chui '926 further teaches these features (see figure 2).

Regarding claims 7-8, 15-16, Chui '926 fails to explicitly teaches Daubechies 9/7 filter and Haar filter. However such filters are well known and widely used method in the art (Official Notice) because (1)Daubechies 9/7 filter has very good rate has very good rate-distortion performance and (2) the Haar filter has a low computational cost, shortest filter length, and capability for not causing any undesirable boundary effects.

Claims 11-14 are also rejected for the same reasons as set forth in claims 2-5 above.

Regarding claim 18, Chui '373 further teaches arithmetic encoder (col. 1 lines 60-61.

Regarding claims 17, 19, 22-26, and 44-46, Chui fails to explicitly teach bit plane encode and hybrid encoder because these encoders are well known (Official Notice) in the art.

The advanced statements with regard to claims 2-5 above are incorporated herein. With regard to claims 29-34, 38-41, Chui '926 further teaches use of computer program stored on a computer readable memory medium (see col. 23, lines 18-23).

The advanced statements with regard to claims 7-8 above are incorporated herein. With regard to claims 35-36, and 42-43,

Chui '926 further teaches use of computer program stored on a computer readable memory medium (see col. 23, lines 18-23).

The advanced statements with regard to claim 1 above are incorporated herein. Both Chui '926 and '373 teach a decompression system (see machine 202 for performing decompressing shown in figure 1 of Chui '926; and decompressor 18 shown in figure 4a of Chui '373) as required by claims 50-51.

5. Claims 6-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 6, the closest prior art (Chui '926) fails to teach or suggest the features recited in claim. Claim 7 is also allowable as being dependent upon claim 6.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Zeng et al. (US Patent No. 6,236,757B1) and Bheda et al. (US Patent No. 4,943,855) teach wavelet compression.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy M Dang whose telephone number is 7033051464. The examiner can normally be reached on Monday-Thursday from 6:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H Boudreau can be reached on 7033054706. The fax phone numbers for the organization where this application or proceeding is assigned are 7038729314 all communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 7033060377.

dmd
3/13/03

ANDREW W. JOHNS
PRIMARY EXAMINER